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ABSTRACT

Computers offer the teacher a tool for instruction in the Social Studies that allow students to be motivated, learn social skills, attain moral ideals, develop thinking skills, and acquire knowledge easily. The findings of this review suggest that the software selected for classroom use must reflect the desired educational goals and that the teacher needs to have a clear understanding of the objectives and of the technologies' strengths and weaknesses. In order to evaluate effectively and measure the computers' contribution to education, the review indicates that the emphasis in standardized testing should focus on the knowledge that computers are able to instill in students. Time, patience, quality training, creative software, and commitment to the use of computers in the classroom are all necessary for the computer to show its true capabilities. The subject areas of language arts, mathematics, and sciences frequently use computers in the classroom. Case studies of the effectiveness of computers in the schools provide differing results and factors for consideration. Contains 23 references. (Author/CK)

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EFFECTIVE USE OF COMPUTERS IN THE SOCIAL STUDIES

A REVIEW OF THE LITERATURE
WITH IMPLICATIONS FOR EDUCATORS

BY DAVE CLARK

U.S. DEPARTMENT OF EDUCATION
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ADVANCED STUDIES IN TEACHING SOCIAL STUDIES

CALIFORNIA STATE UNIVERSITY AT LONG BEACH

SPRING 1992

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INTRODUCTION

The emergence of computers as a tool for students to acquire or expand their knowledge has found its way into nearly all schools, if not the classroom. Chambers (1980) reports that 54 percent of all school districts were using computers by the year 1980. Since this was reported over 12 years ago, we would assume that at the rate suggested by Goodspeed (1988) of an increase in computers used in the schools by 25 percent between 1987 and 1988, that by today the districts employing computers in their schools or classrooms must be approaching 90 percent or greater.

Teachers and students alike are using computers in Mathematics for drill and practice, problem solving, and critical thinking exercises. In the subject area of Language Arts, computers are used to develop the process of writing, grammar and punctuation skills, reading skills, and again critical thinking strategies. Similar use for the computer in the sciences and other subject areas is found in the classroom as well.

The subject area of Social Studies has been the slowest to embrace the advantages computers bring with them into the classroom. This does not deny the instruction in their social relevance or even the social aspect of using computers, but more directly the teaching of the more traditionally perceived ideas of Social Studies' skills and knowledge. It is assumed that the instruction of computer use, knowledge, and the social aspects will occur in all subjects where computers are used as a tool of instruction. Suggested reasons for the lack of computer use in schools is availability, time scheduling, software availability, curriculum integration or relevance, and computer awareness and attitudes among teachers and administrators (Budin, Kendall, and Lengel, 1986).

A more recent survey conducted by Rooze and Northup (1990) of the members of the National Council for the Social Studies was to assess the use of computers in the social studies' classroom. Four questions were suggested: (1) are computers available for use in the classroom, (2) if available, are they used, (3) how are they used, and (4) what are teachers' attitudes towards

computers and the training to use them? What they found was that computers are being used in the classroom for Social Studies instruction. But while 84 percent of the respondents had access to computers, only 54 percent of these (or 46 percent of the total) actually used computers during the school year. Computers were used (by descending rank) for simulations, word processing, drill and practice, databases, tutorials, and problem solving strategies. Seventy percent placed a high positive value on their use in the classroom, even though most respondents felt a need for further training, software development and awareness, and the instruction in effective teaching techniques for the classroom teacher. An interesting finding in their research is that elementary school teachers appear to use computers significantly more frequently than the secondary school teachers. An explanation for this finding is not offered, but one may assume that actual student time spent in the classroom and the availability of computers may play an important part.

STATEMENT OF PROBLEM

What this introduction to the research suggests, is that while computers are in schools, teachers appear not to be using them in large numbers for the instruction of the Social Studies curriculum. Is it the perception that computers can not provide meaningful instruction in developing critical thinking, or that the computer is best used for simply drilling students on facts and managing data? And when they are being used, are the computers really being used effectively to teach the skills and knowledge as found in the Social Studies curriculum? What should be the teacher's role in the classroom when computers are being used for instruction? Will this role of the teacher change or stay the same? Also, do the advantages as suggested by their use in other subject areas relate to their use for the instruction of the Social Studies curriculum? Does the use of computers create any controversies for society to address? The last question, which this author hopes to answer for the reader of this text, is why use computers at all?

The scope of this paper will address the issues mentioned above, but will focus on the area of using simulation programs in the teaching of the social studies curriculum based on the California State Framework for the History and Social Sciences (1988). While the question of cost is no doubt an important consideration, only schools and their districts can make this financial decision based on their budget. Therefore, this paper will not deal with this issue.

RESEARCH FINDINGS

The Social Studies curriculum tends to perceive the use of machines, in this case computers, as a step away from the understanding of mankind and its social parameters. After all, one of the goals of the Social Sciences is to teach students how to behave effectively in society. Budin, Kendall, and Lengel (1986) see people entering the social sciences as means of removing themselves from anything that is quantitative. Also, that due to the fear of an emerging autonomous society, teachers have a distrust of machines that may eliminate the human element in making decisions or reasoning out problems. Unfortunately, while these are pertinent issues to be addressed, it is the lack of motivation and the decrease in thinking skills found in our students today that most worries this author.

The computer is a highly motivational tool for the student to use in the classroom. It provides instant feedback for the user, can be tailored to meet the needs of the individual learner by using color images and/or sound (for the visual and/or auditory learner), is hands-on or interactive (for the kinesthetic learner), may be used individually or in small to large groups, offers a myriad of programs that reflect different interest levels or teaching strategies, and may be used to introduce, reinforce, or teach a vast amount of skills and knowledge. These statements best reflect the current perceptions and assumptions of computers by teachers and administrators.

MOTIVATION AND LEARNING STYLES

Computers, due to their inherent characteristics, may best be able to meet or match the students' learning style(s) compared to more traditional means used in the schools today. The work of Dunn and Dunn (1986) on learning styles has identified 21 different elements that are grouped into five categories.

Those being:

1. Environmental Stimuli

   amount of light, sound and warmth preferred by a student, and the degree of formality preferred.

2. Emotional Stimuli

   by whom a child is motivated, degree of persistence and responsibility, and structure.

3. Sociological Stimuli

   whether a child prefers to work with peers, alone, in pairs, with a team, with an adult, or in varied groupings.

4. Physical Stimuli

   an individual's modality preference, need for food and drink, best time of day for learning, and need for movement.

5. Psychological Stimuli

   whether a student is global and/or analytic, right and/or left hemisphere preference, impulsive or reflective.

To these stimuli may be added certain learning traits, such as: auditory, visual, and kinesthetic.

If one employs a computer as a primary tool in the instruction of skills and knowledge, by its own nature the computer will able to fulfill many of these needs. Computers are extremely visual through the use of either colored or monochrome monitors. Since this is a visual society

raised on television and video games, most software is developed with this in mind. Movement on the screen by images or letters draw the user into the lesson to a greater extent than traditional texts or illustrations. This is especially motivational since the user may have control over what will appear on the screen. Sound is also a common feature of most software. Here the user is further "captured" by sounds that may represent the visual effects (letters, words, actions) or be used as a means of instruction through commands or interactive programs. A good example of a software program that meets the descriptions above would be the simulation program *Where in the USA is Carmen Sandiego?*. The kinesthetic learner enjoys the feel of the keyboard, mouse, and/or the newer writing pads for graphic programs, as well as the interaction of both the visual and auditory experiences.

The computer, in terms of either the sociological or emotional stimuli, provides the students with the opportunity to work by themselves, in small groups, or in a large group/whole class situation. Further, each of these may dictate or influence the degree of formality, attitude, motivation, and/or perseverance the student will exhibit in the classroom. While it is beyond the scope of this paper to address the strategies to be taught and/or learned in collaborative or cooperative learning situations, both strategies would appear to be adaptable to simulation programs that might require several participants or teams to meet the criteria for successful completion of the program. The California State Framework for the History and Social Sciences places a strong emphasis on the development of participation skills for grades K-12. These skills reflect the need for students to be able to participate effectively in our society on a personal, social, and political level. As suggested by the research, the use of computers appear to meet these requirements. The reseach into this specific area of computers is clearly lacking and needs further study.

THINKING SKILLS

There are two primary learning processes identified by Ryba and Anderson (1990). The first is the Behavioral Perspective that emphasizes the role of the environment in learning and instruction. This is how the environment may affect the quality and quantity of learning. The second process is the Cognitive Perspective which emphasizes the events and processes that take place within the individual. This requires a number of mental processes involved in receiving, storing, processing, retrieving, and applying information. Through these two processes, Ryba and Anderson have defined their thinking skills model.

Ryba and Anderson see the computer as the best tool to develop thinking skills and knowledge based on their two perspectives and of even more importance to develop metacognitive skills and strategies in the learner. Ryba and Anderson have identfied four parts for their thinking skills: (1) Exploration (observing, describing, predicting and explaining, comparing and contrasting), (2) Analysis and Planning (identifying the problem and analyzing for options that will lead to a solution), (3) Questioning (knowing how and when to ask questions), and (4) Self-Monitoring (checking and regulating activities, evaluating and revising activities). The computer, as viewed by Ryba and Anderson, enables the user to learn in a far more engaging, non-threatning, and interactive way than is possible with conventional means. This allows the user to be motivated in demonstrating and/or exercising all four parts of Ryba and Anderson's thinking skills model as defined above.

Rooze and Northup (1989) also emphasize their own model of thinking skills in relation to using computers in the social studies. They have divided thinking skills into three categories; (1) Thinking Strategies, where the student conceptualizes, solves problems, and makes decisions, (2) Critical Thinking, in how the student judges the authenticity, worth, or accuracy of the facts or information, and (3) Micro-Thinking Skills, in which the student uses Bloom's Taxonomy, as well

as inductive, deductive, and analogical reasoning. All three are seen as being interrelated and influenced by computer based instruction for their use and development in the student.

Both of these models have merit for the use of computers within the Social Studies curriculum. Lancy (1990) in his study on the use of computers, noted that this was the primary purpose for their inclusion into the Social Studies curriculum. Lancy maintains that computers were found to be very effective in developing higher order thinking skills through the instruction of both process and content. With respect to the development of critical thinking skills as outlined in the California State Framework, students need to define and clarify problems, judge information, and then solve problems and possibly draw conclusions based on a content related problem. Computers may easily offer this, but only if the software was developed with this in mind. Unfortunately much of the current software used in the classrooms requires little thought from the user, such as that found in drill and practice programs. On the other hand simulation programs, such as: *Where in the USA is Carmen Sandiego?*, *Cross Country USA*, *Oregon Trail,* and *The National Inspirer* all involve the thinking skills to a much higher degree. These simulation programs would require the student to use their thinking skills to successfully complete the exercise.

Ryba and Anderson feel that within all educational applications, the computer allows the user to pay attention to the processes of thinking and learning, to experiment, plan, test and evaluate one's progress, to reflect on our thinking, and to have control over one's own learning. These last two relate directly with metacognition. Here the student has the opportunity to reflect on what and how they are learning, empowering the student to guide their own learning. Glasser's (1986) control theory for the classroom offers strong support for this, by having teachers and administrators offer an environment where individuals or groups are allowed to set and explore within their own boundaries of what and how they will learn. Glasser reports great gains in motivation and knowledge when students are allowed to guide their learning. In addition, Glasser's model of student empowerment is best implemented within the cooperative learning

framework, which is one suggested method for using computers. But again, the need is to select the right software.

SOFTWARE CRITERIA

For computers to be effective so must be the software. Ehman and Glenn (1987) suggest that this is one of the reasons why computers have not been so quickly embraced in every classroom or school in terms of the instruction within the Social Studies curriculum. While there exists vast amounts of software to choose from, most is not of a quality that will elicit higher or critical thinking in our students. This has been addressed under Thinking Skills.

The software to be used in the classroom, while meeting the criteria of Ryba and Anderson's model of thinking skills, also needs to be of interest to the student. This software, as suggested by Ediger (1987) must be meaningful, purposeful, and achievable by the student or motivation for learning will not occur. The software must also give the user instant feedback from their own choices and decisions. These need to be based on the reality or realness of our world, rather than the fanciful and the absurd. This is obvious with regards to any classroom instruction, but is frequently ignored when choosing software to use in the classroom. With respect to simulations, the software needs to be realistic, offer low risk decision making for the learner, and again include the need for thinking skills to be explored and practiced. The simulations mentioned so far all fall within this definition.

Ediger also stress that the software needs to reflect what he defines as the philosophies of education. The first is experimentalism, which as mentioned above, allows the student to identify and solve life-like, reality based problems. The second philosophy is idealism. This stresses an idea centered around the social studies curriculum. Here the student learns content information or knowledge that will allow the student to develop and appreciate social ideals and moral standards.

Thus, allowing students to become good citizens in our society. Yet we live in a culturally diverse society that needs to accept and maintain attitudes and mores that are not necessarily adopted as the norm. This author and the reader will agree that as a heterogeneous society there exists certain shared perceptions of right and wrong among all citizens. No doubt these are the morals that Ediger refers to in his description of software ideals.

The third philosophy is realism, where the student can know the real world and how to interpret reality. This applies to the student using objectivity in their evaluations of the problem and the solutions attained within simulation programs. Here, Ediger includes existentialism which emphasizes decision making by students in terms of objectives, learning opportunities, and their appraisal procedures. The use of computers and simulation programs allows the student to make choices based on their being human. The decisions made by the student in a simulation are their own, and may be neither right nor wrong, but unique unto themselves. The motivation for the student is that knowledge becomes more subjective and less objective, decreasing threats to the self-image of less knowledgeable students in the group.

In choosing software, the educator needs to consider the definitions as described in the previous discussions. But how does one know if the software in question fits this criteria? Rooze and Northup (1989) recommend several different sources; The Digest of Software Reviews, The Courseware report card, and the journal Social Education. Other sources are the EPIE Micro-Courseware Pro/File and Report that is distributed to subscribing school districts and the Ad hoc Committee on Computer Courseware Evaluation Guidelines for the National Council for the Social Studies (NCSS). This last source evaluates software based on knowledge, skills, and values. All of these, as well as computer magazines, will provide the educator a wide range of recommendations.

THE TEACHER'S ROLE IN THE CLASSROOM

The traditional perspective holds that all knowledge and instruction passes through the teacher to the student. But Rooze and Northup (1989) place the teacher into the role of a education "manager" where knowledge and instruction are now transmitted through various mediating devices to the student. The computer is simply another form of an instructional medium. As with all mediums used in the classroom, the ability or talent the teacher displays in managing these tools will dictate the degree of success the students will achieve.

Ryba and Anderson (1990) see the teacher's role divided into five categories. Those are:

1. Teacher as Planner

   the teacher ensures that the computer or software are properly integrated into the curriculum, organizes the placement or physical space, and assign groups to work collaboratively.

2. Teacher as Manager

   in assuring equitable access and use of appropriate software relating to student ability.

3. Teacher as Facilitator

   has prior knowledge of the softwares in use, supports students as they learn, helps students set goals for learning, encourages and allows time for reflection, reinforces correct behavior, provides informative feedback, provides a warm and positive environment, and focuses on social, as well as academic competence.

4. Teacher as Guide

   provides appropriate cues for new learning, directs the students' attention to higher thinking skills, and works with students to apply skills

in a variety of tasks.

5. Teacher as a Participant

models correct behavior, collaborates with the students through guided questions, involves students in their own learning (through metacognition), and provides a good mix of verbal, physical, and intellectual activity.

What these categories imply is that the teacher cannot remain a passive member of the classroom when students are using computers. The perception that "I can watch while they play" does not apply for the effective use of computers for any subject or program. The teacher' role is still to teach, but now assumes a different perspective as suggested in the above definitions. Ehman and Glenn (1987) suggest that while the use of computers may require the teacher to take a different role in the students' learning, the general components of effective instruction will still apply. This list of components include (1) gaining and attaining student attention, (2) informing the learner of their goals and objectives, (3) stimulating recall of prior knowledge and skills, (4) clearly presenting the content, (5) providing for guided practice, and (6) providing for application.

What these components mean, as do the suggestions by Ryba, Anderson, Northup, and Rooze, is that what occurs before and after the lesson (in this case the software/simulation) has an equal importance with the actual exercise undertaken by the students. The teacher assumes the same "traditional" role (in that we are still developing thinking skills and knowledge) both preceding and following the exercise, while the greatest change in the teachers' role will occur during the time students spend using computers/simulations.

SIGNIFICANCE WITHIN OTHER SPECIFIC CONTENT AREAS

LANGUAGE ARTS

Computer assisted learning (CAL) and/or computer assisted instruction (CAI) viewed from the perspective of the Language Arts is highly motivational and effective for the student in learning the skills necessary for writing within their primary language. The work of Miller-Souviney and Souviney (1987) in studying the effectiveness of computers in the teaching of the process approach to writing places computers far ahead of the more conventional means of paper and pencil. They found that students wanted and were able to spend far longer writing compositions with fewer mistakes compared to the paper and pencil approach. This is also supported by the studies of Thomas (1985) and Schaeffer(1987). Both authors related positive changes in the student's attitude and motivation when allowed to use computers as their primary tool for writing texts. Thomas also revealed decreases in errors and increases in word counts and the perceived quality in student's texts. Why is this so?

The computer allows the user to easily change mistakes in spelling punctuation, grammar, develop texts without the need for tedious rewrites, to move words, sentences, and/or paragraphs easily within their texts, and to have before them a neatly typed page. And most important meet the needs of the individual learner as discussed earlier under Motivation and Learning Styles. All of these will increase the motivation for students to write, to write longer, and to write better.

The choice of software appeared to have no effect (as opposed to that suggested in the Social Studies), though one would assume that more powerful programs may allow the student greater freedom in their manipulations of their texts, thus encouraging more writing of a higher quality. Observations by this author tend to support this assumption. Students using AppleWorks (a simple word processing program that mirrors typewriter produced work) write less in quantity and quality versus what they write using AppleWorks IIgs (a program that offers similar capabilities to those found in Microsoft Word or Works programs) using the same computer.

The research findings while not conclusive, suggest small groups tend to produce superior work. This relates to Ryba and Anderson's claim that computers and learning is most productive in environments that allow and encourage interaction among students. This is also supported by this author's observations of his own students. Groups who were encouraged to interact and work with different students on a daily basis, produced fair superior texts than when they had worked alone. This allows partnerships to develop to ensure that everyone is helping and learning in their group.

It also appears that Ryba and Anderson's assertions for the development of the thinking skills are at play throughout the writing process. The need for the student to move mentally about within the process approach, would require the use of their thinking skills to a very high degree. Gunn (1989) also places the emphasis on the process-oriented approach in writing with computers. She sees the student more actively involved with the method of developing finished texts compared to the end product. Ritter (1987) offers the need for students to use peer or group conferences to revise or edit their texts. Within this perspective, the thinking skills model and the strategies suggested by Glasser for group learning apply to the use of computers within the language arts framework.

MATH AND SCIENCES

Both, the California State Framework for Mathematics and for the Sciences places computers as a tool for the teaching of these content areas. Ryba and Anderson (1989) provide the student and teacher mathematical situations where their thinking skills model may best be utilized. The most obvious is problem solving through mathematical simulations and any of the exercises offered through the LOGO program. Ryba and Anderson suggest the LOGO program as an ideal tool for students to develop their thinking skills. The simulation programs that create mathematical problems (not drill and practice, but reality based situations that require math and thinking skills)

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tend to mirror the same strategies for the acquisition and development of thinking skills as found in the social studies simulations.

With respect to the Science curriculum, Rooze and Northup (1989) see the student being able to explore, experiment, and come to decisions that simply are not possible in the classroom. Traveling in space or to the bottom of the ocean to test scientific principles is not practical. Simulations though, provide the student the opportunity to do so without leaving the classroom. Students can travel back in time to see what decisions were necessary for early settlers to survive when traveling across the United States in a covered wagon. Within the Science curriculum, simulations appear to provide the same advantages as suggested for both Mathematics and the Social Studies.

CASE STUDIES ON THE EFFECTIVENESS OF COMPUTERS IN SCHOOLS

A study conducted by Wiget (1986) on the instructional effectiveness of computers in seven elementary schools within the Anchorage (Alaska) School District, concluded that their use was neither effective or ineffective in improving academic achievement. This conclusion avoids other possible issues that may have resulted in test scores showing no improvement or difference. These may include such things as socio-ethnic or cultural differences among the students being compared. Also of interest is the sampling method. Wiget is comparing schools that use computers (the seven in Anchorage) against a national average that includes a vast majority that also use computers. Since there is little or no difference between the two samples in terms of what is being achieved on test scores and the use of computers in the classroom, one could infer that computers are effective in the classroom.

The Belridge School in McKittrick, California was an ideal model for a technology based program. Started in 1988, the school (K-8) was designed so that each child and teacher had a computer at their desk, as well as one to use at home. The school was provided with every imaginable technology that would or could be used for instruction. In 1990, their state standardized test scores showed no real improvement in relation to the California state norm. The parents demanded a return to the "traditional" methods of instruction - meaning non-computer based. Through political pressure and school board elections the parents prevailed. Matt Revenaugh who is still the technology coordinator at the school sites several factors for this fallout: differences of opinion on the best learning environment, misunderstandings of the significance of standardized test scores, and lack of guidance or support from either Sacramento or other projects.

An assumption among all educators and lay persons is that simply using computers in a school district or classroom for a set time will increase test scores. This simply will not happen. Computers need to be in place for several years, allowing students and teachers alike to become familiar with the programs/software and their implementation to become effective (Budin, 1986). The integration of computers requires careful planning, training and patience before viable learning can occur. Of further significance is the idea that the skills and knowledge that a student acquires using computers, is not and possibly can not, be measured with the traditional standardized tests used in todays school districts.

A research survey by Woodward and Mathinos (1987) of a large upper grade elementary school that had been using computers for five years, substantiates this position. The teachers and administartors had responed that there was an increase in student attitude, motivation, capability, and knowledge with respect to the curriculums beig taught at their school. The teachers and administrators both felt there a need for a continuing growth process with the computers. This process would need to include further teacher/student training, and the thorough integration of curriculum, software, and standardized testing before the program could be fairly evaluated.

Schools and districts, such as those discussed above, need to be sensitive to these issues when evaluating the effectiveness of computers in their schools.

CONTROVERSIES

The major criticism of computers, deals with the perception of an emerging technocratic society. This involves the dehumanizing of society , so that people are incapable of emotion and social consciousness. "Currently the new technology threatens the further homogenization of information and poses dangers to civil liberties and human dignity. New developments are propagated by self-interested industries and welcomed by technocratic administrators desiring to economize on education. Further, reactionary technocratic governments promote the introduction of new devices in education not only for efficiency and economy, but also to get a stronger grip on its content. Although personal contact between teacher and children remains the major educative factor today, computers threaten this tradition by eliminating teacher authority and further isolating children from human interaction. While computers promise advantages in solving convergent problems, they also promise the inability to solve divergent problems requiring feeling, understanding, love, and ethical values, " (Langeveld,1983).

While this smacks of a "1984" mentality, and requires careful consideration, it does make certain false assumptions. It assumes the roles of the teacher and student as passive, uninformed bystanders who have nothing to contribute to the instructional process. The teachers and students in today's classrooms are all taking a more active role in the direction of modern education. Changes in teaching strategies and curriculum development are leading to an emergence of quality schools. If the teachers fail in taking this role, than the claims Langeveld makes will prevail. Computers will lead to all the of outcomes as described by Langeveld. But if teachers and educators assume the roles as describe in this paper, make informative and educated selections of software to insure thinking skills in knowledgeable students, and use computers in a socially

correct/designed environment, this need not happen. It is up to society to determine the computer's worth, and how it may best "teach" our students.

SUMMARY

The computer offers the teacher a tool for the instruction of the Social Studies, that will allow the student to be motivated, learn social skills, moral ideals, develop thinking skills, and acquire knowledge easily. It is imperative, that for this to occur, the software selected must reflect the desired goals, and that the teacher has a clear understanding of the objectives, and the technologies' strengths and weaknesses. The emphasis in standardized testing needs to reflect the knowledge that computers are able to instill in students , if we are to be evaluate and measure effectively the computers' contribution to education. Time, patience, quality training, creative software, and commitment to this medium are all necessary for the computer to show its true capabilities within our classrooms today.

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